WHAT IS CLAIMED IS:

1. A ring type wavelength division multiplexing passive optical network (WDM PON) system using the same wavelength for forward and backward channels, comprising:

a central office including general media converters (MCs) each having a transmitter adapted to convert an electrical signal into an optical signal to be outputted, and a receiver adapted to receive an optical signal having the same wavelength as the output optical signal, and to convert the received optical signal into an electrical signal to be outputted, and a WDM multiplexer/demultiplexer (MUX/DEMUX) for multiplexing optical signals of different wavelengths respectively outputted from the general MCs, and externally outputting the resultant multiplexed optical signal, the WDM MUX/DEMUX also demultiplexing a multiplexed signal, externally inputted thereto, and outputting the resultant demultiplexed signals to respective general MCs;

a coupler for transmitting the multiplexed signal outputted from the WDM MUX/DEMUX through two different optical communication lines in a distributed manner, while transmitting an optical signal received from any one of the optical communication lines to the WDM MUX/DEMUX;

the optical communication lines constructing a ring type distribution network through bi-directional add/drop devices

each coupled to the optical communication lines; and

remote nodes including redundancy MCs respectively coupled to the bi-directional add/drop devices, each of the redundancy MCs functioning to detect a line breakage, and to transmit an optical signal only in a clockwise or counter-clockwise direction in accordance with the result of the detection.

2. The ring type WDM PON system according to claim 1, wherein at least one of the remote nodes further includes a 3-port add/drop device coupled to the optical communication lines constructing the ring type distribution network.

3. The ring type WDM PON system according to claim 1 or 2, wherein each of the bi-directional add/drop devices comprises first and second WDM thin film filters having opposite signal travel directions between the optical communication lines,

the first WDM thin film filter dropping a particular wavelength one of optical signals, received from a first one of the optical communication lines, to a master channel of the redundancy MC coupled to the bi-directional add/drop device, while receiving an optical signal having the same wavelength as the dropped optical signal, and reflecting the received optical signal to the first optical communication line, and

the second WDM thin film filter dropping the particular wavelength one of optical signals, received from a second one of the optical communication lines, to a slave channel of the redundancy MC, while receiving an optical signal having the same wavelength as the dropped optical signal, and reflecting the received optical signal to the second optical communication line.

4. The ring type WDM PON system according to claim 3, wherein each of the redundancy MCs comprises:

first and second couplers respective connected to the master channel and the slave channel;

master and slave transmitting/receiving units respectively connected to the first and second couplers, each of the master and slave transmitting/receiving units functioning to convert an electrical signal into an optical signal, and to transmit the optical signal to the coupler connected thereto, while functioning to convert an optical signal received from the connected optical coupler into an electrical signal, and to output the electrical signal to an optical network unit;

a control unit for detecting respective states of the master and slave transmitting/receiving units and a fiber breakage status, thereby activating a selected one of the master and slave transmitting/receiving units to perform

transmitting and receiving operations; and

interfaces respectively connected to the master and slave transmitting/receiving units, each of the interfaces performing a data interfacing operation between an associated one of the master and slave transmitting/receiving units and the optical network unit.

5. The ring type WDM PON system according to claim 4, wherein the control unit disables a transmitter included in the transmitting/receiving unit associated with the currently-activated channel, and detects whether or not a receiver included in the associated transmitting/receiving unit can be switched to a link-on state, thereby determining whether or not a fiber breakage status occurs.

6. A switching media converter (MC) usable in a wavelength division multiplexing passive optical network (WDM PON) system using the same wavelength for forward and backward channels, comprising:

a master transmitting/receiving unit for converting an electrical signal received from an optical network unit into an optical signal, and transmitting the optical signal to a coupler for a master channel, while converting an optical signal received from the coupler for the master channel into an electrical signal, and outputting the electrical signal to

the optical network unit;

a slave transmitting/receiving unit for converting an electrical signal received from an optical network unit into an optical signal, and transmitting the optical signal to a coupler for a slave channel, while converting an optical signal received from the coupler for the slave channel into an electrical signal, and outputting the electrical signal to the optical network unit;

a control unit for detecting respective states of the master and slave transmitting/receiving units and a fiber breakage status, thereby activating a selected one of the master and slave transmitting/receiving units; and

interfaces respectively connected to the master and slave transmitting/receiving units, each of the interfaces performing a data interfacing operation between an associated one of the master and slave transmitting/receiving units and the optical network unit.

7. The switching MC according to claim 6, further comprising:

a buffer arranged at a rear end of the interface connected to the slave transmitting/receiving unit, and adapted to perform a data buffering operation.

8. The switching MC according to claim 6 or 7, wherein

the control unit disables a transmitter included in the transmitting/receiving unit associated with the currently-activated channel, and detects whether or not a receiver included in the associated transmitting/receiving unit can be switched to a link-on state, thereby determining whether or not a fiber breakage status occurs.